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Innovation in Small & Medium Enterprises in São Paulo

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Abstract

The Brazilian Small & Medium Enterprises (SMEs) represent over 98% of all active companies in the country in 2020. The role of innovation in processes must receive special attention, which leads us to write this article to measure the Dimensions of Innovation in companies. The Radar of Innovation was applied to support the model of the diagnostic method tool, which was established to perform data analysis with the needs of each organization. Through this methodology, analyzing the 12 Dimensions of Innovation for a sample of 20 SMEs in the manufacturing segment, in the south region of São Paulo, is used for the research fieldwork. The role was to promote recommendations and collaboration, to improve the opportunities to be replicated in other organizations with similar challenges. The contribution of this work is the Dimension Processes, since most participants had common results. They all found the need to differentiate themselves from their competitors.

Keywords

SMEs, innovation, industry, processes, measurement of innovation.

1. INTRODUCTION

In the 1980s, the Brazil's industries reached their peak, at 22% of the GDP value, added to the Brazilian economy. However, this trend went into rapid decline in the past decade and at the end of 2014, the national GDP from this segment was estimated at 11%, according to the Brazilian Institute of Geography and Statistics - IBGE (2019). In the years 2015 and 2016, the industries suffered most during the economic crisis, amounting to a decrease of about 6% from January 2015 to December 2016, the largest downturn in history, according to IBGE. Currently, the economic environment remains unfavorable, which encourages firms to opt for a line of lean production and reduced costs, according to SEBRAE (2020).

Even with a drastic decline in sales, the domestic industry is still the second largest industry in America, ranging from steel, automotive, and computers, as durable goods. Amid an uncertain climate of urgency and risk, it is necessary to innovate to generate long-term economic value. Thus, it is becoming something fundamental to the survival of businesses in the competitive current market.

In the world of Small & Medium Enterprises (SMEs), innovation is a challenge on small budgets. According to the Oslo Manual, produced by the Organization for Economic Cooperation and Development (OECD), the factors assisting or compromising innovation are:

“the innovation process is assisted by a variety of sources of information: internal sources (within the firm), external market sources, educational and research institutions, and generally available information; innovation may be hampered by economic factors, ones relating to the enterprise, and with a miscellany of others” (OECD, 2007, p. 50).

By the neo-Schumpeterian approach, innovation is essential for the survival of a company, especially in highly competitive markets. Considering the economic difficulties inherent in the current Brazilian economic crisis, the conditions to generate a culture of innovation become difficult for small industries (FREITAS et al, 2017).

This article studied and applied a diagnostic tool (survey) to measure the degree of innovation in SMEs, to disseminate and contribute to the culture of innovation as an alternative to mitigate the effects of the crisis.

The general goal of this article is to understand the influences related to improvement and innovation in the dimension processes in companies, as they affect the degree of innovation of the sample. The specific objective is to diagnose and contribute with innovation recommendations for the processes of twenty SMEs in the manufacturing segment of the southern area of the São Paulo city.

2. INNOVATION

According to the Oslo Manual (OECD, 2007), the minimum entry is that the product or process should be new (or significantly improved) for the company (it does not have to be new to the world). According to Facó and Mandel (2016), though, innovation differs from invention because: The invention arises from a creative process, not necessarily a commercial purpose, previously defined. From the moment a new product, service, or business process reaches society and produces some result, then yes, it becomes innovation (FREITAS, 2018).

In The Oslo Manual, innovation aims to improve the performance of an organization by enhancing its competitive edge, or for maintaining their competitiveness. It can occur through development and improvements in the product mix or through new markets and/or customers. Alternatively, innovation may occur through a reduction of production costs, purchasing, distribution, or transactions. Or, the company may opt for the improvement of its innovative capacity, increasing its ability to develop products and processes to acquire and create knowledge (OECD, 2007).

Individually observing each company, a customized system is noticed, with specific attributes and characteristics adapted to their own needs. Thus, undertaken innovations should strengthen these differentials. They need to seek efficiencies compatible with their products, their customers, and the environment in which they operate. They need to better short-term results, tangible in nature, or most desirable, intangible. These innovations should be most apparent in the medium and long-term development of their organizations.

From the perspective taken in this study, the Dimension Process takes on an even more relevance in the world of SMEs. Since innovation can be present in processes involving a specific area of the business, such as sales, payable accounts, etc., then it can connect different areas of the business, customers, and suppliers along the value chain. It should be emphasized that, often, the latter requires a much greater effort in terms of knowledge, Information and Communication Technologies, or ICTs (Davenport, 1990). Small business owners can take their first steps in search of better competitiveness through incremental innovation. This innovation may bring more immediate results because much of its competitiveness is derived from the way the organization articulates its processes. For instance, employing

time, people, and space, which, in the visions of Joia (1994) and Turban, Wetherbe and Mclean (2007), appear reflected on Figure 1

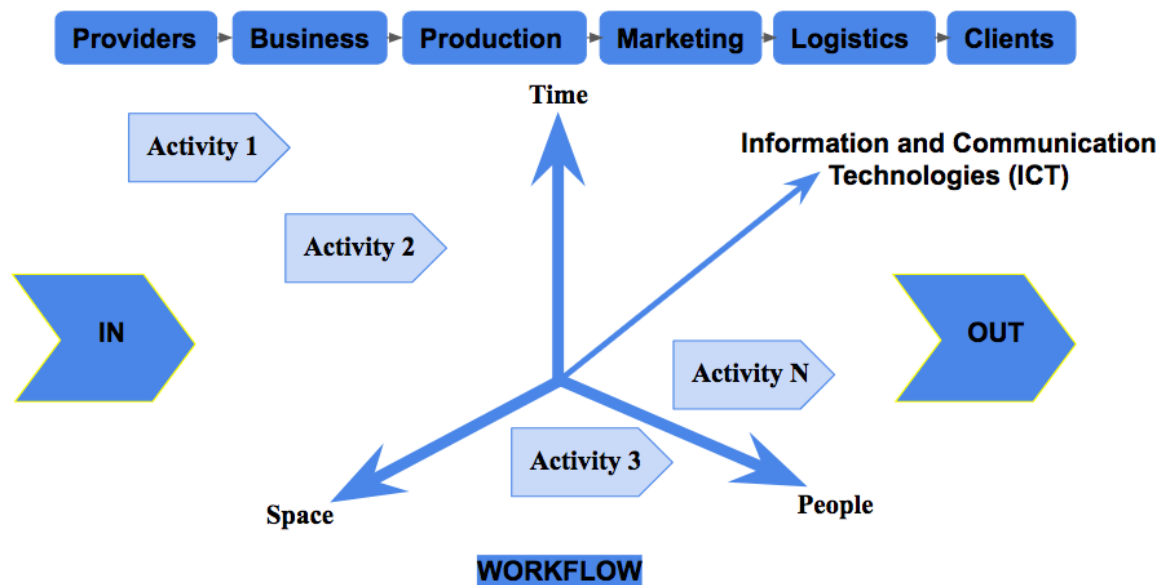


Figure 1: Graphic representation of a process (workflow). **Source:** Freitas, 2019.

The effective application of ICTs, as depicted in Figure 1, tends to show that there is a noticeable reduction in three areas: space, people, and time. The application is reflected in benefits, which can translate into productivity gains and reduced costs for the benefit of the organization. The application is due to a "(...) set of interrelated activities, time, people, and space, which receive input (data) and should generate outcomes (results) of value, whether for internal or external customers" (JOIA, 1994, p. 20).

3. Methodology: Innovation Radar

Sawhney, Wolcorr, and Arroniz at the Kellogg School of Management (2006), created the Innovation Radar used in this work, later adapted by Bachmann & Associates (2008). This tool evaluates, via a questionnaire, an SME's innovation at that moment considering features that small and medium organizations have compared to bigger organizations. In the context of SMEs, it would be inappropriate to measure innovation with aspects such as the number of patents, investments in research and development (R&D), as used in the Oslo Manual, since the Manual does not distinguish the size of the organizations.

According to Bachmann (2008), innovation in SMEs occurs in different forms than in large companies, and therefore the method of measuring the degree of innovation should be distinct. Several studies conclude that the process of innovation management has a physical dimension, with favorable organizational structures, and an intangible dimension related to behavior, freedom of communication, risk-taking culture, and the practice of creative techniques. The model adopted, in addition to the measurement, aims to recommend improvements with action plans, along with the monitoring of continuous and personalized learning for each company.

The authors mapped and scheduled visits to the SMEs, and entrepreneurs with suitable profiles were chosen for the study. The chosen SMEs allowed the survey to be conducted within the following parameters: The enterprises were framed by the annual revenues from R\$ 360 000.00 to R\$3.6 million per year, in the manufacturing segment, in the southern region of São Paulo. The notion that regional factors can influence the innovative capacity of firms has led to increasing interest in analyzing innovation at the regional level (OECD, 2007).

The application of the diagnostic questionnaire, called the Innovation Radar, was completed on-site, at each company. The collected data has been analyzed in this article. The measurement within the Innovation Radar is not absolute, but a reference for improvements and the potential to innovate, existing in the analyzed organization.

The Innovation Radar evaluates how the environment of a business is conducive to innovation, after all, the widely accepted concept is that an innovative company trains its employees to solve problems and fosters creativity as part of the organizational culture.

To expand on Sawhney's original twelve Dimensions of Innovation, Bachmann established his perspective in an additional, new dimension: the addition of the "Innovative Ambience" dimension, directly relates to influencers' services as an external source of innovation. The Innovative Ambience dimension consists of paid consulting, development agencies, free advisory, universities, research centers, etc.

The questionnaire applies the Likert scale, which consists of three levels and scores from 1 to 5, to identify and rank companies, quantitatively. The first level denotes companies with Little or No Innovation, corresponding to the score of 1; the second level defines the Occasionally Innovative companies, and the corresponding score of 3; and the third level indicates the Systemic Innovative companies, with a corresponding score of 5 (BACHMANN et al, 2008). When administering the questionnaire, only the last three years of the companies' operations were taken into account. Hence, the questionnaire measured the current situation of the organizations, as actions taken before this period do not meet the criteria for present-day innovation.

The Innovation Radar was administered through formal interviews, on the spot, and done individually or with a group of decision-makers in the participating organizations. After application of this tool, data were tabulated to generate charts and graphs, showing the degree of innovation for each of the thirteen radar dimensions. The result was the overall index of the companies' innovation.

The results were later presented in the form of feedback to the heads of each organization. The points of the greatest relevance were explained in detail, in a personalized manner to each company. Table 1 exemplifies a sample table for each company, in Figure 2, a sample graph generated by the questionnaire. Observing Table 1, the ends correspond to the highest scores in the company. In contrast, the closest points on the graph's center correspond to the least developed dimensions. These opportunities for improvement were offered to the companies' leadership teams, in hopes that they would improve on the dimensions would create the greatest impact for their companies.

Table 1: Table generated by the Innovation Radar for a particular organization.

Level of innovation	Average
A - Offer	3.0
B - Platform	2.0
C - Brand	3.0
D - Customers	1.7
E - Solutions	1.0
F - Relationship	2.0
G - Value	1.0
H - Processes	1.0
I - Organization	3.7
J - Supply Chain	1.3
K - Presence	2.0
L - Network	2.0
M - Innovative environment	1.3
Level of Global Innovation	1.9

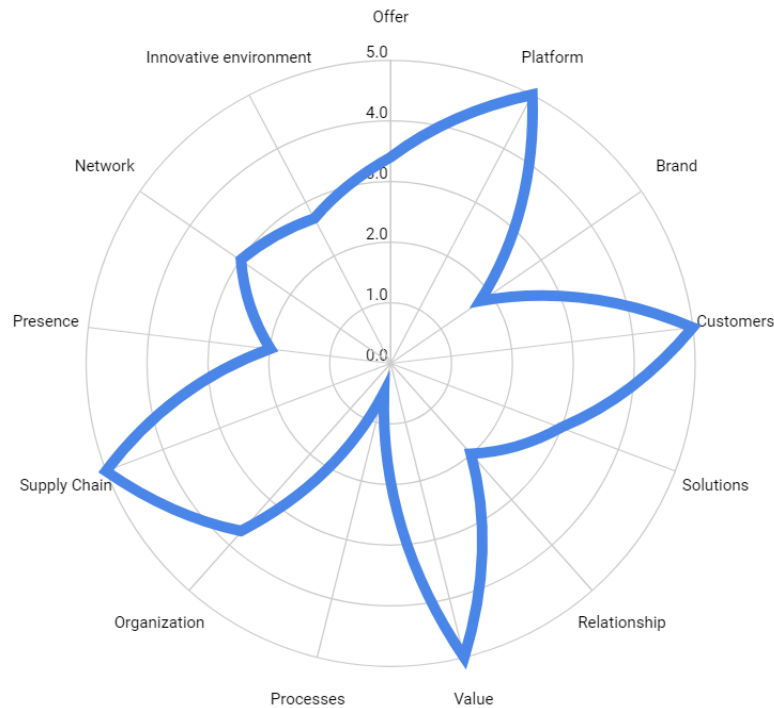


Figure 2: Radar of Innovation generated by one SME. **Source:** (Freitas et al, 2018b and 2019).

Observing the averages of the set of 20 sampled companies, the Dimension Process shows the lowest score (corresponding to the letter H in Table 1). Therefore, it can be considered a potential opportunity for innovation within each company. It was noticed that the Dimension Process corresponds to the reality of the current economic crisis. This dimension is relevant to small businesses in the industry sector, since the decrease in production may be, in many cases, an alternative to reduce operating costs. The limited production may also lead to a climate of employment insecurity, hence, a climate less prone to innovation. Case in point, a printing industry, observed in the sample, lost a customer that demanded 60% of its production. This resulted in highly skilled employees with higher wages being fired. Then, the company lacked skilled labor for certain finishing techniques, which generated additional problems. This snowball effect could have been prevented, if innovative steps were taken before the economic crisis, such as increasing its customer base. Another aspect noted in the crisis was the elimination of external services, such as consulting or training.

4. Discussion and analysis of results

During the research, it was noted that business owners found it difficult to obtain long-term loans at reasonable interest rates to finance innovation, leading them to pursue innovations out of necessity, and therefore reactively. By analyzing all the companies in the sample, it was possible to diagnose and define improvement opportunities in their processes:

- a) **People Management:** Entrepreneurs mostly showed dissatisfaction with employees in the relationships and cultural aspects of the company. For example, behavior, attendance, delegation of tasks, and commitment to the company's rules were some elements they mentioned;
- b) **Financial Management:** The main problems were related to the misuse of cash flows, mismanagement of payable and receivable accounts, lack of planning and financial education;
- c) **Marketing Management:** There were deficiencies in grouping customers according to their needs, loyalty, prospecting, distribution, and after-sales;
- d) **Organizational Management:** There was insufficient definitions of roles and tasks, role delegation, and identification of employee responsibilities;
- e) **Production Planning and Process Control:** In several cases, a lack of tracking or alignment of inventory, production, quality control, shipping, and planning was found.

As the above obstacles were prioritized by the companies' owners, suggestions were made to generate a common groundwork, with the purpose of improving those companies. Then, action plans were developed to resolve management processes.

This premise shows that aligned and consolidated management is the first step to creating a steady, innovative culture in the search of significant results (Porter, 2001).

There were several challenges observed in the companies, such as neglect; lack of monitoring; lack of method or discipline to maintain the organization's processes, warehouses, manufacturing industry, and offices. Moreover, waste should be avoided and analyzed strategically.

Expanding the focus, some factors aggravated the organizational management and restructuring of small firms in the sample, the strongest example of this, being the economic crisis of the country (the strongest example is the economic crisis of the country). According to SEBRAE (2020), the main cause of the manufacturing industry's production decline was the reduction of investments, especially in machinery and equipment, seen in both private and governmental companies. Other difficulty identified was to find skilled labor or reach new target markets, which highlights weaknesses in the strategies or investments, limiting the use of productive capacity and generating idleness.

Table 2 shows the scores reached for each dimension. Companies are identified with the letter "E" at the top of the table; the dimension averages are shown in the far-right column, and the companies' totals are listed in the bottom row of the table:

Table 2: Score obtained from the radar Innovation applied to the sample firms

Dimension	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17	E18	E19	E20
1 Offer	3.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0	4.0	2.0	3.0	3.1	5.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
2 Platform	2.0	1.0	5.0	4.0	4.0	3.0	2.0	1.0	4.0	2.0	3.0	4.0	2.0	2.0	3.0	2.0	4.0	2.0	4.0	4.0
3 Brand	3.0	3.0	4.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	1.0	3.0	4.0	2.0	4.0	3.0	2.0	4.0	4.0	3.0
4 Customers	1.7	1.3	4.3	3.1	2.0	2.7	3.7	2.3	2.3	3.7	2.0	2.0	3.0	2.0	3.0	3.7	2.0	3.0	3.0	3.0
5 Solutions	1.0	3.0	5.0	2.0	3.0	3.0	3.0	4.0	2.0	3.0	4.0	4.0	2.0	2.0	3.0	3.0	4.0	3.0	4.0	4.0
6 Relationship	2.0	2.0	4.0	4.0	1.0	4.0	5.0	1.0	4.0	4.0	4.0	4.0	2.0	2.0	3.0	5.0	3.0	4.0	4.0	4.0
7 Value	1.0	1.0	2.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0
8 Processes	1.0	1.0	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	3.0	2.7	2.0	2.3	2.3	3.0
9 Organization	3.7	2.0	3.1	1.7	3.0	4.0	3.7	3.7	2.3	2.0	4.2	2.0	3.0	2.0	3.0	3.7	3.0	3.0	2.0	3.0
10 Supply Chain	1.3	2.0	2.0	3.1	4.0	4.0	2.0	2.0	2.0	2.0	4.0	2.0	2.7	1.0	3.0	2.0	2.0	1.0	3.0	4.0
11 Presence	2.0	1.3	3.1	3.0	2.0	4.0	2.0	1.7	2.0	2.7	2.3	3.0	3.0	3.0	4.0	2.0	2.0	3.0	3.0	2.0
12 Network	2.0	1.7	2.1	4.0	2.0	3.0	4.0	2.0	2.0	3.0	2.0	4.0	2.0	2.0	4.0	4.0	3.0	3.0	4.0	2.0
13 Innovative environment	1.3	2.0	2.0	2.7	2.1	2.7	2.0	2.0	1.3	2.0	2.0	2.0	2.3	1.0	2.7	2.0	1.9	2.0	3.3	3.3
Company average	1.9	1.9	3.2	2.8	2.5	3.3	3.0	2.5	2.5	2.5	2.7	2.9	2.7	2.1	3.3	3.1	2.8	2.9	3.4	3.2

As it can be observed, eight companies achieved averages above three. They are considered by the methodology as Occasional Innovative companies. However, most of the other companies reported not having made significant changes in their processes over the past three years. This resulted in low scores for the Dimension Process, receiving a designation of Little or No Innovation. This shows that, from the perspective of those managers, their processes have not received the focus for desirable innovation. 60% of organizations are, on average, below three, most reached a minimum score in the Dimension Process.

The common factor in the companies was business conduct, treating innovation as something specific and not as a continuous process. From the 20 companies surveyed, seven scored below half, which places them in the category of Little or No Innovation. Finally, the Systemic Innovative companies are the companies with a score of 5 (maximum overall innovation performance). But it is important to note that each company has its own entity and faces a different set of challenges, even when it takes part of the same industrial size.

After an individualized diagnosis for each company, action plans were suggested. The action plans demand improvements in management, to build foundations for the development of cultural innovation. It became clear that most companies made innovations in "emergencies", for instance, innovations arising from insufficient alternatives, aimed at survival in the market. The dimensions that are more developed in the sample companies, with higher scores on the Innovation Radar, are Presence, Offer, Brand, and Relationship.

The most implemented actions to improve processes were attending courses on people management, quality, and finances; consulting and advisory services for cash flow refinement; rebuilding organizational chart; offering marketing workshops; standardizing processes and customer service to reduce waste; optimizing resources and increasing customer satisfaction; implementing loyalty programs; expanding the audience with service to new markets, increasing participation in fairs and conferences; and finally, offering new products, or kits assembled with existing products.

Observing Table 2, we can observe that most organizations had a score of 1 in Dimension Process, meaning that, these companies have Little or No Innovation. Experience in the field has shown that entrepreneurs were mostly conservative concerning production, demonstrating hesitation to invest in this dimension. The employees need a period of adjustment for production

changes or maturation process. SMEs normally have a lack of capital investment, and therefore, seek to work in other dimensions that may have more short-term returns, such as reducing costs, or focusing on direct sales.

The authors found that although these companies were framed by their revenues as small businesses, their management style proved to be closer to micro-businesses, with weak administrative operations. The entrepreneurs were focused on productive activities or routines and struggled to keep qualified employees. This resulted in, production bottlenecks and insufficient incentives for innovation.

Managers' greatest difficulty was the delegation of manual, routine duties. Often, they chose the manual work over the administrative tasks, leaving the administrative tasks unchecked. It can also be argued that the Dimension Process was not regarded as a priority by employers. In general, entrepreneurs tend to resist change in their businesses, avoiding risks.

Some of the suggested actions to improve the Dimension Process, were the standardization of production processes; development planning; control of production processes; implementation of quality tools; cultivation of partnership with other companies and suppliers to streamline inventories; documentation of inventory for finished products; and management of raw materials and waste, for example, recycling resale waste.

None of the companies analyzed had professionals allocated to developing or deploying innovations. Furthermore, none of the companies was able to hit a strong overall diagnosis mark. Consequently, companies are not considered innovative in the manufacturing segment. In this case, we can see a major deficiency in the processes of small businesses in the south region of São Paulo.

5. Final considerations

This article's main component is to identify opportunities for improvement and innovation in the Dimension Processes in the interviewed companies. Note, small businesses have a lot in common, for example, most began as micro or family businesses, and after their growth, had a financial gain, as well as an increase in the number of employees, etc.

The lack of strategic planning and strong management practices that aligned with the company's values, a context that was addressed in the analysis of the results, greatly limited the potential for innovation in small businesses. A culture of innovation as a continuous process depends on robust management, skilled and motivated employees, to power innovation as a means of stimulating the development of the organization.

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Biographies

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